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Questions about the operations with images**How to open several images at once?**

There are several ways to open a group of images. You may open them using the files open dialog, select images and press *Open* button. You may also select the images of interest with the left mouse button with pressed *Ctrl* key in the *Manager* panel list, open the context menu with the right mouse button and select *Open* command.

What is the maximum size of the image that can be opened by ScanMagic application?

ScanMagic application, thanks to its on-the-fly data spooling technology, enables to open and to work with images of any size. However, for some formats there are restrictions of the supported maximum image size.

How can an image be converted from one format into another?

There are several ways to change the image format. You may use *Raster Converter* or just open the image and then save it to the required format.

How can the image quicklook be created?

Open the image, perform zooming and contrasting and save it with *Save View As* function into a required format, e.g. in jpg.

What is the difference between Save Image As and Save View As options?

In *Save Image As* mode the image is exported "as is". i.e. with input set of channels, input radiometric resolution and contrast. In *Save View As* mode the image is exported with the current image view window display parameters, i.e. with current color synthesis (*RGB*) or channels (*Grayscale*), with current scale and contrast, with radiometric resolution of 8 bits per pixel.

How to make and indexed image with own palette?

You need to open the image of interest, go to *View* tab, activate *Index Color* radio-button and set up the number of spectral channel for visualization. Then assign the palette to the selected channel, create the palette in the appearing *Color Table* dialog, select from the existing or load one via *Load* button. Specify the palette name with *.pal* extension in the appearing palette selection window and press *OK*.

How can DEM and terrain image be colored?

You need to open DEM image, in *View* tab activate *Index Color* radio-button and select the number of spectral channel for visualization. To set up a palette, press palette selection button and in the appearing *Color Table* dialog specify the palette of interest from the list or load your own palette. After that press *OK*.

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How can image segmentation results be visualized?

Segmentation results are saved to the first «*Band1*» channel of the image. To visualize the segmentation result, use the index color mode by activating *Index Color* radio-button with the default «*Band1*» channel. In *Color Table* dialog, select *Segmentation* or any other suitable palette in the opening list of palettes.

Can the image, used to create a Region, be contrasted?

Yes. To do so, select the name of the image being contrasted in *SubImage* control element and use image visualization and display elements of the *View* panel to set up contrasting parameters. Pay attention that when *Region* line is selected in *SubImage* control element, the actions via toolbar extend to the entire image of the *Region*, whereas if the name of one of the images is selected, the actions are limited to this image only.

How can the RGB image be received from single-channel files of the image (e.g. Landsat)?

Open all single-channel files in the program and create mosaic from these single-file images, assigning the channel of one of the input images to each mosaic's channel.

How can the spatial resolution of the color image be improved?

Open the color image and the matching panchromatic image of higher resolution. Create *Region*, specifying the mosaic type *Synthesis From Multiple-Band Image* and setting up 4 output channels (three for color image and one for pan). Keep in mind, which *Region* channel has the pan image channel assigned to, and press *Apply*. After creating *Region*, check *Resolution Merge* box in *View* panel and enter the number of the pan image channel.

No transformation into UTM zone. What can be the reason?

UTM projection is a zonal projection, therefore make sure that the projection zones are selected correctly or select *Autoselect* option when transforming the image, which will automatically define the UTM zone, where the image is located..

What is the scattergram of pixel digital number?

Scattergram of pixel digital numbers - is the graph, which x-axis is used to specify pixel DN values of the first image channel selected for analysis, whereas the y-axis - of the second channel. Basically, it is a diagram of dispersion of pixel digital numbers of two channels being analyzed.

Questions about operations with vector maps

How can a new vector map be created?

Open the image and move to *Vector* panel. In *Vector Editor* group of elements press «*Start vector layer editing*». Vector layer type selection dialog will open. After selecting a vector map type, press «*Create object*», then create the

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vector objects on the image, plotting points in the areas of interest on the image. Complete vector objects creation with the right mouse button click on the last point. After plotting all vector objects on the image, press «*Stop vector layer editing*». In the appearing file save dialog name the new vector map and press «*Save*».

How can a vector map be edited?

Open the image, put the vector map of interest on it and select this vector map in the list on *Vector* panel. In *Vector Editor* group of elements press «*Start vector layer editing*», then start editing the map's vector objects. After editing completion, press «*Stop vector layer editing*». In the appearing file save dialog select «*Save*» and save the vector map.

Why during editing of vector maps, vector objects' coordinates are rounded off?

If maps of a higher resolution are overlaid on a lower resolution image, then vector objects' coordinates of this map are rounded off to the resolution of the image. Therefore, if it is required to edit a vector map as a whole, saving input details and accuracy of all objects, create *Region* to the entire territory with high resolution (matching the precision of the map's coordinates), then put the vector map on this *Region*, edit it and save under a different name.

How can a vector map fragment be cut out?

You may use vector converter, which dialog can be opened via *Tools -> Vector Converter* menu. In the dialog window, add the vector map of interest to the list of input files, checking *Cut Segment* box and specify boundaries (X, Y) of the fragment being cut out. Press *Convert* button.

Questions about operations with catalog tools

What cataloguing tools may be needed for?

If one of your tasks is to work with a big number of images, cataloguing tools, available in the application, enable you to easily create image catalogs and to quickly search for images using attributes. In addition, application allows the user to work with catalogs, located on other servers, as well as to export/import metadata.

How can a record about the image be saved to the catalog?

There are two options to save a record to catalog. You may open the image and select *File-> Add to Catalog* menu item. A form for adding records to catalog will open. Enter the information about the image and press *Save Record*. To add information about image, represented in form of a list in *Manager* panel, select the images of interest, press right mouse button and in the context menu select *Add to Catalog*. A form for adding records to catalog will open. There are also ways to quickly add images into the current database. For this to do, select *Fast Add to Catalog* in the context menu.

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How can a new database for the catalog be created?

After opening the form of adding records to catalog, you may enter the name of the new database into *Database* field and press *Save Record*. The application will show up a dialog to confirm the new database creation. Press *OK* to save the record of interest into the new database.

How to select records about non-geolocated images?

Go to *Catalog* panel and specify the database, where you will start to select from in *Database* field. In *Geolocated* drop-down list select *No*. Press *Search*.

When working with catalog, there is a possibility to save the image dump. What is this?

Image dump is a set of files, containing information about this image: metadata file with inf extension, quicklook of the image in jpg format. Shape-file in ESRI SHP format, projection file in prj format and quicklook of the map with image boundaries in png format. These files are created in a separate folder of the directory, specified by the user.

How to move through the records, selected for putting into the catalog and editing?

You may use *Next Image* and *Prev. Image* buttons to move through the records in the form for records addition to catalog and *Next Record* and *Prev. Record* buttons to browse the records in edition mode. You may also use the slider, located over the indicated buttons. The number to the left of the slider shows the index number of the current record in the group of records.

Why during catalog editing quicklook and the shape-file are not added?

If initially when the record was added to catalog, the quicklook and ESRI shape-file were not saved, than the quicklook and the map with plotted image boundaries will also not be added if checked when the record is being edited.

What should be done to work with databases, located on other PC?

You need to set up the remote server. For this to do, open *File-> Options*, go to *Catalog* tab and press *Add Server*. In the appearing dialog of server addition, specify the server parameters and press *Add*. After adding a new record to the list of available servers, select it and press *Set Default*. *Catalog* panel will display databases of the specified server.

How can the data of the catalog, I have created, be transferred to the users?

There several ways to transfer catalog data to the users. You may create *Dumps* of the images of the catalog of interest and send them to the users. Besides, you may use *Export Catalog* option, specifying the name of the catalog and the directory to save it. The received data may also be transferred to the users, who in their turn should use *Import Catalog* option to import the catalog to their application.

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Questions about operations with geolocation and ground control points

How to identify, if the image is geolocated or not?

There are several ways to find, if the image is geolocated or not. If the icon of the image window is in form of a page with the globe, the image is geolocated. If the icon is in the form of a blank page – the image is not geolocated. Besides, the info about geolocation of the open image can be found in *Geo* tab. If the *Simple Image* radio-button is activated, the opened image is not geolocated. If *Geolocated Image* is activated – the image is geolocated. Geolocation can also be detected by moving the mouse pointer along the image field: if it is geolocated, *Info* tab will display geographic coordinates on-line.

How can geolocation be corrected?

Geolocation can be corrected using *Geo* tab, which elements enable to recalculate parameters of the used mathematic geolocation model. To do so, you will need to overlay a vector map over the image and check geolocation quality while changing parameters. For RS data that are geolocated based on math models, describing relocation and satellite attitudes, a handy *Geo Pan* tool is available. This tool enables to match the map against the image with calculation of geolocation model parameters.

How can I learn from the image which part of the globe is shown?

If the image is geolocated, there are the following ways to find it. You may open *Manager* panel and *Region* window with overlaid vector maps of administrative boundaries of the countries and coastal lines and open the folder the image of interest. All geolocated images will be displayed in *Region* window as coverage contour lines. If the image of interest is selected from the list, it will be highlighted in red in *Region* window and you will detect immediately what is the location of this image. You may open the image of interest and in *Info* panel find geographic coordinates of the image. Or use *World Map* tab of *Navigator* panel.

Why during the image export into one of the formats its geolocation is lost?

If the image is geolocated, the location can be lost, if the image is saved in a format not meant for storing map projection parameters. To save image geolocation select proper formats, such as GeoTIFF.

How can I recalculate coordinates from one projection into another?

You need to use *Coordinates Converter*, which dialog can be opened via *Tools* -> *Coordinates Converter*. In the dialog window specify input and output projection parameters and load or manually enter coordinates values. For recalculation, press *Convert* button. Recalculated coordinate values will be displayed in the list of output coordinates.

How can the “image-to-image” geolocation be carried out?

Open the image which needs to be geolocated and the reference image. Pick up control points using elements on *GCP* panel and refresh geolocation (*Image*->*Refresh Geolocation*). Now you can transform input image into a map projection and its geolocation will be corrected with due account for set up control points.

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How can the “Image-to-map” geolocation be carried out?

There are two options. You may open the initial image and any geolocated image with overlaid map. Pick up control points using *GCP* panel. When the image is transformed into the required map projection, its geolocation will be corrected with due account for these GCPs. The other option is to place the initial image in *Region* and overlay a vector map. In this case control points will be picked up in one *Region* window. In this case press *Refresh Geolocation* after picking up GCPs.

How can a list of GCPs be created without having vector maps and other images available?

You may use *Global Maps* mosaic coverage. Open the image and *Global Maps* window for the area of interest. Use *GCP* panel, pick up control points from the image in *Global Maps* window, working with it as with usual geolocated image.

Questions about operations with map services

What map service can be used for?

Map services, allowing access to multi-terabyte global coverages, can be used as sources of base maps, for example if vector maps are not available for a certain area. Besides, an easy way to move between different map services is available in the application. Such services are combined in one window, where they can be used as common large images.

What needs to be done to display the area of interest in Global Maps window?

You need to open *Global Maps* by pressing the button having the same name on the toolbar. Then open *Navigate* in *Global* panel. In the appearing dialog specify the coordinates of the area of interest and press *Go*. For minor image relocations in *Global Maps* window, you may use the group of buttons *Pan (Left, Right, Up, Down)*.